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+ institute.

INSTITUT INTERNATIONAL D'ORGANISATION SCIENTIFIQUE DU TRAVAIL.

Procès-verbaux des réunions du Comité Exécutif,

tenues à Genève les 12 et 31 janvier 1928, au siège de l'Institut.

I. Séance du 12 janvier 1928.

La séance est ouverte à 9 heures 45.

Assistaient à la séance :

M. Francesco Mauro, Président,

M. François Sokal, Vice-Président,

M. le Professeur J. Willits, représentant Mr. H.S. Dennison, Vice-Président,

M. Georges Fleury, représentant le Bureau international du Travail,

M. Paul Devinat, Directeur de l'Institut,

M. Percy S. Brown, Directeur-adjoint de l'Institut.

Après avoir souhaité la bienvenue au Professeur Willits, représentant Mr. H.S. Dennison, le PRESIDENT annonce que M.M. Jouhaux et Hinnenthal ne pouvant assister à la séance ont fait connaître leurs points de vue respectifs dans des lettres dont il sera donné communication au cours des débats.

1. Présentation du budget pour 1928. Acceptation définitive et envoi à tous les membres du Conseil de direction.

Le budget de 1928 est adopté sans débat.

Le PRESIDENT demande au Comité Exécutif son avis sur la question de l'envoi du budget aux membres du Conseil de direction, sous sa forme actuelle ou sous une forme résumée.

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(Work Simplification [illegible]) ~~[illegible] N.Y.~~

WORK
SIMPLIFICATION
CONFERENCE

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by

ALLAN H. MOGENSEN

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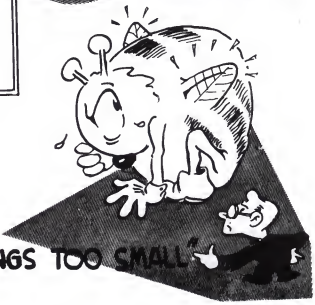
The BUMBLEBEE CAN'T FLY!

According to the theory of aerodynamics, and as may be readily demonstrated through experiments, the Bumble Bee is unable to fly—This is because the size, the weight, and the shape of his body, in relation to his wingspread, make flying impossible. BUT the Bumble Bee, being ignorant of these scientific truths, goes ahead and flies anyway—and makes a little honey every day.



A. H. MOGENSEN—WORK SIMPLIFICATION PROGRAMS
LITHO IN U.S.A.

X. T 58. W6 #5

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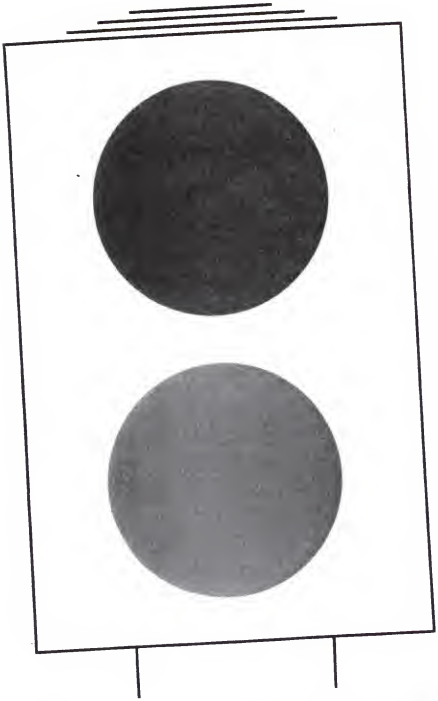

WHICH LIGHT DO YOU HAVE ON?

W6

WORK SIMPLIFICATION AND YOU

RECOMMENDED BASIC FILMS

A-1 Demonstration Reel - Silent - 15 min. approximate running time
A-2 March of Ideas - Shop Version - Sound - 12 min.
A-3 March of Ideas - Office Version - Sound 12 min.
A-5 Dollars and Sense - Sound, Color - 11 min.
A-6 Band Balls of Yarn - Silent - 7 min.
A-7 The Easier Way - Sound - 12 min.
B-4 Three to be Served - Sound - 25 min.
B-5 Productivity - Key to Plenty - Sound - 21 min.
B-6 The Power Behind the Nation - Sound, Color - 20 min.
Write U.S. Treasury Department (your local office) to secure this.
B-7 In Balance - Sound - 40 min.

RECOMMENDED READING

* Leadership to Ensure Collaboration - F.J. Roethlisberger
* Reference from "Management and the Worker" - Roethlisberger & Dickson
* A Planned Failure in Work Simplification - Reprint, Modern Management
* Mainsprings of Men - Whiting Williams
* Reader's Digest Article on Rucker Plan (Continental Paper Co.)
* "A Program for Averting Socialism" - Talk by Hughston M. McBain
* Report to Management - Annual Reports - The Wage Earner Forum
* How to Avoid Work - General Motors' Peg Board Article
* Thought Sharters - H.G. Weaver and Dean Russell
U.S.A. - Measure of a Nation - Twentieth Century Fund, published by The MacMillan Co., New York

BOOKS

* New Techniques for Supervisors and Foremen - Albert Walton
* Principles of Industrial Organization - Kimball & Kimball
* Economics in One Lesson - Henry Hazlitt
* The Autobiography of Benjamin Franklin - Benjamin Franklin
* The Law of Intelligent Action - William J. Reilly
* Mainspring - H.G. Weaver
* Frank and Lillian Gilbreth - Partners for Life - Edna Yost
* Why Kill the Goose - Sherman Rodgers
Lincoln's Incentive System - James F. Lincoln, published by McGraw-Hill, New York
Management and Morale - F.J. Roethlisberger, published by Harvard University Press
Scientific Management - Frederick W. Taylor, published by Harper & Bros. New York
Cheaper by the Dozen - Frank B. Gilbreth, Jr. and Ernestine Gilbreth Carey, published by Thomas Y. Crowell Co., New York

* Your reference material

W6

V. 1 Sa. W6 #16

WORK SIMPLIFICATION AND STEADY EMPLOYMENT

If you really want progress, and the change that makes it possible, you may find yourself in the minority, for only a few are willing to pay the price of progress.

At our last meeting, we discussed Work Simplification and its relation to Progress -

1. The application of intelligent selfishness to improve our standard of living.

2. Our objective: TO MAKE A BETTER PRODUCT AND RENDER BETTER SERVICE, AT A LOWER COST, AT THE RIGHT TIME.

3. Resistance to change and resentment of criticism.

In view of Item 3 - the two great stumbling blocks of human nature - how can we explain the marvelous progress the world has made, especially in the Twentieth Century? There are two reasons:

First: There is that occasional individual who is intensely interested in trying to make something better.

"The whole fun in living is trying to make something better."
- Kettering.

"I am 81 years old today and still working hard. I am not much of a speech maker, so you will have to take my work as a proof of my love for the race, rather than my words. - Edison.

Second: We have competition. Competition has been called the "Great Universal Supervisor," for it is the force that puts us to work or out of work. There are rare cases where companies that have no competition make continual improvements in quality or service, or voluntarily reduce their prices; but they are few, and most people take the line of least resistance and require competition to force them to change and improve.

"We must improve everything, and if we think we have reached the limit of improvement on anything, we are on the way out. We oftentimes speak of a man who is 'down and out,' meaning, thereby, a failure; but it is just as true of the man who thinks he has succeeded and has stopped improving. He is UP and out." - George Eastman.

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WORK SIMPLIFICATION AND STEADY EMPLOYMENT

RECOMMENDED BASIC FILMS

C-1 Let's Go America - Sound - 12 min.
C-3 Machinery Creates Employment - Sound - 6 min.

RECOMMENDED READING

* How to Study - Northwestern University
* Role Playing and Management Training - Alex Bavelas
* Management The Simple Way - Lawrence A. Appley
* We Must Produce Togetherness or Perish - Walter Cenerazzo

BOOKS

* Principles of Industrial Organization - Kimball & Kimball
* Management, Labor and Technological Change - John W. Riegel

Technology and Labor - Elliott Dunlap Smith, published by Yale University Press.

Organized Labor and Production - Morris L. Cooke & Phillip Murray, published by Harper & Brothers

The Dynamics of Industrial Democracy - Clinton S. Golden and H.J. Ruttenberg, published by Harper & Brothers

How to Read Better and Faster - Norman Lewis, published by Thomas Y. Crowell Co., New York

X-T 54.10 #4

WORK SIMPLIFICATION AND MEASUREMENT

At our last meeting, we discussed WASTE, and emphasized the importance of eliminating waste of time, energy and materials. WASTE STEALS PROFITS and ENDANGERS WAGES. In our program to eliminate waste, let's remember that we want to make it easier for the operator not to make waste.

To eliminate all forms of waste, we must assemble the intelligence of our whole organization. Do not belittle the ideas you can get from the people working with you and for you. The greatest obstacle to simplifying work has not been created by technical difficulties. Rather, it is set up by the mental attitude of people doing the work who feel that they are already using the best possible method.

One of the big jobs of human engineering is to change people's attitude toward work from one of indifference to an enthusiastic outlook. All individuals display "enthusiasm" as a result of different stimuli: financial rewards, a building of promotion "credits," "getting in good with the boss," or the sheer joy of accomplishment, all have their followers. One strong weapon which we have at our command to induce enthusiasm is PRAISE. This is a dangerous tool, however, for there is a fine balance to be made between praise and criticism. And a good deal can be accomplished in improving the manner in which we criticize people, remembering that we all resent criticism.

Charles M. Schwab once said:

"I am a firm believer in the fact that men make their greatest accomplishments by proper encouragement - not by criticism. I have yet to see the man, however great and exalted his situation, who is not susceptible to the approval of his fellow men. And the severest criticism that can come to any man is not to find fault with him, but not to notice him at all. When a man is not noticed he knows that he has not gained the approval of his fellows, but when he is approved he gives forth his best effort."

Experiments with praise, criticism, or neglect seem to indicate the following:

1. On first administration, praise and criticism seem to provide about equal stimulus.

2. On continued application, praise proves to be a continuous incentive.

W6

WORK SIMPLIFICATION AND MEASUREMENT

RECOMMENDED BASIC FILMS

D-6 Original Maiden Form Brassiere Process Chart - Silent - 8 min.
D-11 Weigh, Leather Belt - Silent - 4 min.
F-35 Form X - Silent (Run at Sound Speed) - 11 min.
F-37 The Flow Process Chart and How to Use It - Sound, Color - 22 min.

RECOMMENDED READING

* Work Simplification - Marshall Field & Co.
* Work Simplification - Lockheed Aircraft Corporation
* Your Rewards Through Work Simplification - The Maytag Company
* Operation and Flow Process Charts - American Society of Mechanical Engineers

BOOKS

* Principles of Industrial Organization - Kimball & Kimball
  Frederick W. Taylor - Father of Scientific Management - F.B. Copley, published by McGraw-Hill

U = Unpriced
P = Priced

WORK SIMPLIFICATION CONFERENCES
LAKE PLACID, N. Y.

PAGE #10

FLOW PROCESS CHART

JOB Pricing and Posting Orders

☐ MAN OR ☒ MATERIAL Orders

CHART BEGINS on A's desk

CHART ENDS on C's desk

CHARTED BY John Smith DATE Oct 1, 1948

SUMMARY

	PRESENT U	PRESENT P	PROPOSED U	PROPOSED P	DIFFERENCE U	DIFFERENCE P
○ OPERATIONS	13	10	10	8	3	2
⇨ TRANSPORTATIONS	4	2	2	1	2	1
□ INSPECTIONS	0	0	0	0	0	0
D DELAYS						
▽ STORAGES	5	4	3	2	2	2
DISTANCE TRAVELLED	120 FT	40 FT	42 FT	14 FT	78 FT	26 FT

	DETAILS OF ~~PRESENT~~ PROPOSED METHOD	OPERATION	TRANSPORT	INSPECTION	DELAY	STORAGE	DISTANCE IN FEET	QUANTITY	TIME	ANALYSIS WHY? WHAT?	WHERE?	WHO?	WHEN?	NOTES	ACTION ELIMINATE	COMBINE	REARRANGE	SIMPLIFY
1	Placed on A's desk	○	⇨															
2	Time Stamped and Sorted	○	⇨															
3	Placed in OUT baskets	○	⇨											2 wire baskets				
4	Waits	○	⇨											Shorter wait				
5	Picked up by B or C	○	⇨															
6	To desk	○	⇨				14											
7	Placed on desk (Priced)	○	⇨															
8	Priced	●	⇨											New rotary Price file				
9	To C's desk	○	⇨				28							By B				
10	Placed on desk	○	⇨															
11	Waits	○	⇨															
12	Posted and Sorted	●	⇨															
13	Placed in Envelopes	○	⇨															
14	Placed in OUT basket	○	⇨															
15	Waits	○	⇨											Picked up by messenger				
16		○	⇨															
17		○	⇨															

U = Unpriced
P = Priced

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WORK SIMPLIFICATION CONFERENCES
LAKE PLACID, N. Y.

NO. 1
PAGE 1 OF 1

FLOW PROCESS CHART

JOB Pricing and Posting Orders

☐ MAN OR [X] MATERIAL Orders
CHART BEGINS On A's desk
CHART ENDS On A's desk
CHARTED BY John Smith DATE Oct. 1, 1948

SUMMARY

	PRESENT U	PRESENT P	PROPOSED NO.	PROPOSED TIME	DIFFERENCE NO.	DIFFERENCE TIME
○ OPERATIONS	13	10				
⇨ TRANSPORTATIONS	4	2				
□ INSPECTIONS	0	0				
D DELAYS						
▽ STORAGES	5	4				
DISTANCE TRAVELLED	120 FT.	40 FT.		FT.		FT.

	DETAILS OF (PRESENT / PROPOSED) METHOD	OPERATION	TRANSPORT	INSPECTION	DELAY	STORAGE	DISTANCE IN FEET	QUANTITY	TIME	ANALYSIS WHY? PLACE	WHO?	WHEN?	HOW?	NOTES	ACTION ELIMINATE	COMBINE	CHG. SEQ.	SIMPLIFY
1	Placed on A's desk	○	⇨	□	D	▽								By messenger				
2	Time Stamped	○	⇨	□	D	▽												
3	Placed in OUT box	○	⇨	□	D	▽												
4	Waits	○	⇨	□	D	▽				✓								
5	Picked up by C	○	⇨	□	D	▽						✓	✓	at least every 15 minutes.				
6	To desk	○	⇨	□	D	▽	20			✓								
7	Sorted into Priced and Unpriced	○	⇨	□	D	▽					✓	✓	✓				✓	✓
8	To B's desk (Priced) →	○	⇨	□	D	▽	40					✓	✓	By C				✓
9	Placed on desk	○	⇨	□	D	▽												
10	Waits	○	⇨	□	D	▽				✓								
11	Priced	●	⇨	□	D	▽							✓					✓
12	To C's desk	○	⇨	□	D	▽	40							By B				
13	Placed on desk	○	⇨	□	D	▽												
14	Waits	○	⇨	□	D	▽												
15	Posted	●	⇨	□	D	▽												
16	To A's desk	○	⇨	□	D	▽	20						✓	By C		✓		
17	Placed on A's desk	○	⇨	□	D	▽				✓						✓		
18	Waits	○	⇨	□	D	▽				✓						✓		
19	Sorted	○	⇨	□	D	▽					✓	✓	✓	For inside and outside company			✓	✓
20	Placed in envelopes	○	⇨	□	D	▽					✓	✓	✓					
21	Placed in OUT box	○	⇨	□	D	▽					✓	✓	✓					
22	Waits	○	⇨	□	D	▽												

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WORK SIMPLIFICATION CONFERENCES
LAKE PLACID, N. Y.

NO. 1
PAGE 1 OF 2

FLOW PROCESS CHART

JOB Fill Out and Approve Form X

☐ MAN OR ☑ MATERIAL Form X

CHART BEGINS In A's desk drawer

CHART ENDS In B's out box

CHARTED BY AHM DATE 1/31/49

SUMMARY	PRESENT NO.	PRESENT TIME	PROPOSED NO.	PROPOSED TIME	DIFFERENCE NO.	DIFFERENCE TIME
○ OPERATIONS	15	2 HRS				
⇨ TRANSPORTATIONS	2	1/2 HR				
□ INSPECTIONS	2					
D DELAYS	5	2 DAYS				
▽ STORAGES	1					
DISTANCE TRAVELLED	600 FT.		FT.		FT.	

DETAILS OF (PRESENT) ~~PROPOSED~~ METHOD	OPERATION	TRANSPORT	INSPECTION	DELAY	STORAGE	DISTANCE IN FEET	QUANTITY	TIME	ANALYSIS WHY? WHAT?	WHERE?	WHEN?	WHO?	HOW?	NOTES	ACTION ELIMINATE	COMBINE	SEQUENCE	SIMPLIFY
In A's desk drawer	○	⇨		D	▽									No definite location				
Removed and placed on desk	○	⇨		D	▽									Disorderly desk				
Filled out	●	⇨		D	▽													
Placed in "Out" box	○	⇨		D	▽									Long reach				
Waits	○	⇨	□	D	▽									for messenger pick up				
Picked up by messenger	○	⇨		D	▽									Difficult grasp				
To B's office	○	⇨		D	▽	300								Delay				
Placed in "IN" box	○	⇨		D	▽													
Waits	○	⇨	□	D	▽													
Picked up by B	○	⇨		D	▽									Difficult grasp				
Examined	○	⇨	□	D	▽													
Signed	●	⇨		D	▽													
Placed in "OUT" box	○	⇨		D	▽									Long reach				
Waits	○	⇨	□	D	▽									for pick up				
Picked up by messenger	○	⇨		D	▽									Difficult grasp				
Back to A	○	⇨	□	D	▽	300												
Placed in "IN" box	○	⇨		D	▽									Location of box bad				

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WORK SIMPLIFICATION CONFERENCES
LAKE PLACID, N. Y.

NO. 2
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FLOW PROCESS CHART

JOB Fill Out and Approve Form X

☐ MAN OR ☑ MATERIAL Form X

CHART BEGINS In A's desk drawer

CHART ENDS In B's out box

CHARTED BY AHM DATE 1/31/49

SUMMARY

	PRESENT NO.	PRESENT TIME	PROPOSED NO.	PROPOSED TIME	DIFFERENCE NO.	DIFFERENCE TIME
○ OPERATIONS	15	2 HRS APPROX	10	1 HRS APPROX	5	1 HR APPROX
⇨ TRANSPORTATIONS	2		1		1	
□ INSPECTIONS	2	1/4 HR APPROX	1	1/4 HRS APPROX	1	
D DELAYS	5		3		2	
▽ STORAGES	1		1		0	
DISTANCE TRAVELLED	600 FT.		300 FT.		300 FT.	

	DETAILS OF (PRESENT/PROPOSED) METHOD #1	OPERATION	TRANSPORT	INSPECTION	DELAY	STORAGE	DISTANCE IN FEET	QUANTITY	TIME	ANALYSIS WHYT WHAT	WHERE	WHEN	WHO	HOW	NOTES	ACTION ELIMINATE	COMBINE	SEQ.	SIMPLIFY
1	In A's desk drawer	○	⇨	□	D	▽													
2	Removed and placed on desk	○	⇨	□	D	▽													
3	Filled out	●	⇨	□	D	▽													
4	Placed in "OUT" box	○	⇨	□	D	▽									Long reach				
5	Waits	○	⇨	□	D	▽									for messenger pick up				
6	Picked up by messenger	○	⇨	□	D	▽									Difficult grasp				
7	To B's office	○	⇨	□	D	▽	300												
8	Placed in "IN" box	○	⇨	□	D	▽													
9	Waits	○	⇨	□	D	▽													
10	Picked up by B	○	⇨	□	D	▽									Difficult grasp				
11	Examined	○	⇨	□	D	▽													
12	Signed	●	⇨	□	D	▽													
13	Paper clips removed	○	⇨	□	D	▽													
14	Carbons and copies separated	○	⇨	□	D	▽													
	Placed in "OUT" box	○	⇨	□	D	▽									Long reach				
16	Waits	○	⇨	□	D	▽													
17		○	⇨	□	D	▽													

Litho. in U.S.A.

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WORK SIMPLIFICATION CONFERENCES
LAKE PLACID, N. Y.

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FLOW PROCESS CHART

JOB Fill Out and Approve Form X

☐ MAN OR ☑ MATERIAL Form X

CHART BEGINS In A's desk drawer

CHART ENDS In A's out box

CHARTED BY AHM DATE 1/31/49

SUMMARY

	PRESENT NO.	PRESENT TIME	PROPOSED NO.	PROPOSED TIME	DIFFERENCE NO.	DIFFERENCE TIME
○ OPERATIONS	15		4		11	
⇨ TRANSPORTATIONS	2	1/2 MIN.	0		2	1/2 MIN.
□ INSPECTIONS	2	1/2 MIN.	0		2	1/2 MIN.
D DELAYS	5	2 MIN.	1		4	2 MIN.
▽ STORAGES	1		1		0	
DISTANCE TRAVELLED	600 FT.		0 FT.		600 FT.	

DETAILS OF (~~PRESENT~~ PROPOSED) METHOD #2

	DETAILS	OPERATION	TRANSPORT	INSPECTION	DELAY	STORAGE	DISTANCE IN FEET	QUANTITY	TIME	ANALYSIS WHY? WHAT?	WHERE?	WHEN?	WHO?	HOW?	NOTES	ACTION ELIMINATE	COMBINE	CHG. SEQ.	SIMPLIFY
1	In A's desk drawer	○	⇨	□	D	▽													
2	Removed and placed on desk	○	⇨	□	D	▽													
3	Filled out and Signed	●	⇨	□	D	▽													
4	Carbons and copies separated	○	⇨	□	D	▽													
5	Placed in "OUT" box	○	⇨	□	D	▽													
6	Waits	○	⇨	□	D	▽													
7		○	⇨	□	D	▽													
8		○	⇨	□	D	▽													
9		○	⇨	□	D	▽													
10		○	⇨	□	D	▽													
11		○	⇨	□	D	▽													
12		○	⇨	□	D	▽													
13		○	⇨	□	D	▽													
14		○	⇨	□	D	▽													
		○	⇨	□	D	▽													
16		○	⇨	□	D	▽													
17		○	⇨	□	D	▽													

Litho. in U.S.A.

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Y-I-58.W6 #15

ANALYZING THE METHOD FOR IMPROVEMENT

We have spoken several times of the engineering approach and the scientific method. Can anyone use this approach, or is it limited only to a few scientists and technically trained men?

The late Arthur D. Little, well-known research chemist, once said that there are four marks of a scientific mind:

1. THE SIMPLICITY TO WONDER

   All children have this. It is only the natural curiosity we once all showed.
   When young, we wondered about everything.
   "Why does the sun come up in the East?"
   "Why is the grass green? What makes the snow white?"
   "What makes the clock tick?" - and so on.
   The true scientist and research man wonders about things that many of us take for granted.

2. THE ABILITY TO QUESTION

   Then we asked questions of everyone. Sometimes we got the answers, sometimes we did not. It all depended on how the persons we asked felt, and whether or not they had the time to try and explain.

   Few people know how to ask questions properly, in order to get the right answer. Most of them soon stop asking questions to avoid embarrassment. To succeed in Work Simplification, one must just "WHY? the hell out of everything."

3. THE POWER TO GENERALIZE

   After wondering about something, and asking "WHY?" we often stop there. Instead, we should try to get an idea of some of the reasons or facts behind the obvious thing. We should see whether these same facts will apply if the situation is a little different. Is this thing we wondered about a law, or a fundamental principle? Will it apply in all cases?

4. THE CAPACITY TO APPLY

   It is not enough to wonder about something, to ask questions about it, and to generalize - one must then apply the things learned.

For example, in our program here, when movies are shown illustrating what some other person has done, do you wonder about the operation -

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X-T58.W6 #10

ANALYZING THE METHOD FOR IMPROVEMENT

RECOMMENDED BASIC FILMS

F-11 Make Pyralin Soap Dish - Silent - 4 min.
F-22 Handling Customers Orders - Silent - 15 min.
F-29 Combine Rolling-in with Paint Spraying - Silent - 12 min.
F-33 Assemble Cowl Flap Actuating Rods - Silent - 8 min.
F-34 Taping Hose - Silent - 4 min.
F-36 Disassemble Bicycle Coaster Brake - Silent - 8 min.
F-38 Combine 4 Operations on Automobile Valve - Silent - 8 min.
F-39 Weighing and Stencilling Cases - Silent - 6 min.
Z-4 Selling America - Benjamin Franklin - Sound - 22 min.

RECOMMENDED READING

* Your Rewards Through Work Simplification - Maytag
* Work Simplification - Marshall Field
* How to Sell an Idea - Reader's Digest
* Tact - Wells Publishing Company

BOOKS

* Motion and Time Study - Ralph M. Barnes
* The Autobiography of Benjamin Franklin

Work Methods Manual - Ralph M. Barnes, published by John Wiley and Sons, New York

Motion Study - H.C. Sampter, published by Pitman Publishing Co., New York

Time Study and Motion Economy - Robert Lee Morrow, published by The Ronald Press, New York

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X-T 58.No #7

IMPROVING THE NECESSARY DETAILS

It will be remembered, if we could not ELIMINATE, COMBINE or CHANGE the SEQUENCE of the details in our flow process chart, we then challenged it with a HOW? - CAN WE IMPROVE THIS DETAIL? This usually means a study of the hand motions used. How do principles of motion economy help increase efficiency? When thoroughly understood, they may be applied without the use of motion pictures or elaborate analysis, and, when used, have a decided effect upon the skill of an operator.

Remember the definition of effective (skilled) work vs. hurried (speed-up) work. It is: Work done effectively will give perfect work because it is accomplished by eliminating the unnecessary parts of the job. Work done in a hurry will give poor work because it is a speeding up of all parts of the job, both necessary and unnecessary.

Every supervisor is interested in skill, because even a small increase in skill of all his operators will do far more to raise the departmental efficiency than having a few very highly skilled workers.

While the principles of skill are complex, we can, however, show that they capitalize on the strong human tendency to form habits. Everyone realizes how quickly we form habits of doing things, such as where we like our easy chair, or the route we take coming to work, etc. Some of the highly important factors that go to make up skill can always be recognized when watching a really skilled worker. Some of these factors are consistency, rhythm of movement, precision, speed, ambidexterity (the ability to use either hand), and the coordinated used of both hands simultaneously.

Of course there is a great variation in the natural skill of different operators. Nevertheless, the degree of skill attained by a given operator has been greatly influenced by habit formation during the learning period. If the fundamentals of motion economy referred to are practised from the very beginning of the learning period, a higher degree of skill will be attained.

Now, what are these principles of motion economy, and how will they help provide an efficient work place?

1. PHYSICAL ACTIVITY OR MOTIONS SHOULD BE PRODUCTIVE. This means that every non-productive motion should be eliminated as far as possible. An orderly work place ("A Place For Everything

T 58
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X. T 58. 1/10 #12

IMPROVING THE NECESSARY DETAILS

RECOMMENDED BASIC FILMS

J-1 Drilling Holes in Small Pins - Silent - 8 min.
J-2 Clipping Brassieres - Silent - 15 min.
J-5 Motion Study Applied to Letter Indexing - Sound - 11 min.
J-8 Motion Study Applications - Sound - 22 min.
J-10 Protect and Sign Checks - Hood - Silent - 8 min.
O-21 Gathering and Stapling - Lockheed - Silent (Run at Sound Speed) 11 min.
O-25 Work Simplification Adapted to Clerical Procedures - Sound - 22 min.
Contact your local Standard Register Company office (if one) for this first.

RECOMMENDED READING

* Motion and Time Study Applications - Ralph M. Barnes

BOOKS

* Motion and Time Study - Ralph M. Barnes
Motion Study - H.C. Sampter
Time Study and Motion Economy - Robert Lee Morrow
* Methods-Time Measurement - Harold B. Maynard, published by McGraw-Hill
Manual Skill - J.W. Cox, published by Cambridge University Press
Work Methods Manual - Ralph M. Barnes

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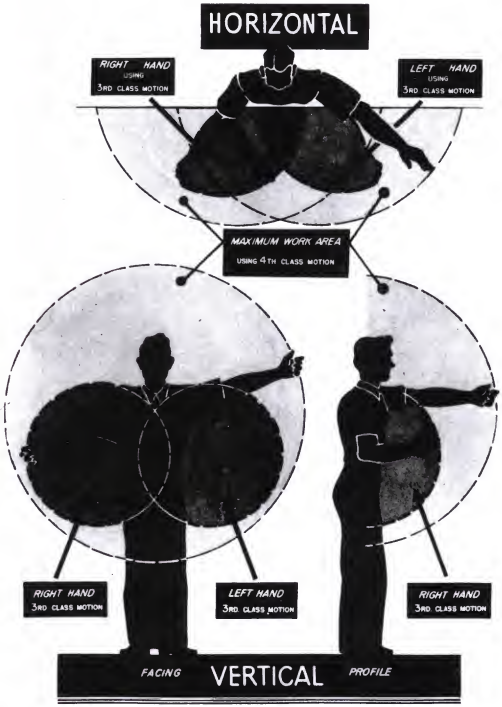
X-T58.W6 #19

NORMAL AND MAXIMUM WORKING AREAS FOR HAND MOTIONS



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X-T 59 ... #20

WORK SIMPLIFICATION AND YOUR EFFICIENCY

Are you too busy to be efficient? Is being busy and being efficient necessarily closely related? Many people taking up Work Simplification have said, "I can see that making a process chart would help improve a job, but I am too busy to make one." Often foremen and supervisors have made their charts after hours or at home because they did not have the time during working hours. This, we know, defeats the main purpose of the process chart. To accurately portray a process, the person making the chart must actually "walk through" the job. So let us look at this question of not having enough time.

Ask yourself, "Am I really managing my job or is my job running me?" Obviously, the foreman in "Loose Screws in the Screwball Machine Works" was not running his job. Remember, the first step in getting order is the order of time. We must consider the order of time just as much as the order of things if we are to eliminate waste.

"Philosophers have explained space. They have not explained time. It is the inexplicable raw material of everything. With it, all is possible, without it, nothing. The supply of time is truly a daily miracle, an affair genuinely astonishing when one examines it. You wake up in the morning, and lo, your purse is magically filled with twenty-four hours of the unmanufactured tissue of the universe of your life! It is yours. It is the most precious of possessions.....

"You have to live on this twenty-four hours of daily time. Out of if you have to spin health, pleasure, money, content, respect, and the evolution of your immortal soul. Its right use, its most effective use, is a matter of the highest urgency and of the most thrilling actuality. All depends on that."

- from "How to Live on 24 Hours a Day"
by Arnold Bennett

Personal planning is the measured order of time. Everyone is faced with the problem of utilizing his time to the best advantage. Each of us must decide how we will use our time, but there are basic ideas and tools of management that can help us to make the most of "the unmanufactured tissue of life" given to us each 24 hours.

In the first place, we know that time:

1. Can be definitely measured;

2. Is always passing and never returns;

3. Can be wasted, just as we waste materials and energy.

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W6

X.T 58.W6 #71

WORK SIMPLIFICATION AND YOUR EFFICIENCY

RECOMMENDED BASIC FILMS

Y-2 Loose Screws at the Screwball Machine Works - Sound - 11 min.
Y-6 Snowball Conference - Sound - 13 min.
Y-7 Four Steps Forward (Castle) - Sound - 22 min.
Y-8 Yes Man Conference - Sound - (25 min.?)

RECOMMENDED READING

BOOKS

* The Autobiography of Benjamin Franklin
* How to Develop your Executive Ability - Daniel Starch, published by Harper & Brothers
* New Strength for New Leadership - Erwin H. Schell, published by Harper & Brothers

How to Live on 24 Hours a Day - Arnold Bennett - Sun Dial Edition - published by Garden City Publishing Co.
Wake Up and Live - Dorothea Brande, published by Simon & Schuster, New York
How to Train Workers Quickly - Glenn L. Gardiner, published by Elliott Service Co., Mount Vernon, N.Y.
How to Instruct - Glenn L. Gardiner, published by Elliott Service Co.
Psychology in Industry - Norman Maier, published by Houghton-Mifflin Co., New York

.T 58
.W6

MULTIPLE ACTIVITY CHARTS -
THE SECOND TOOL OF WORK SIMPLIFICATION

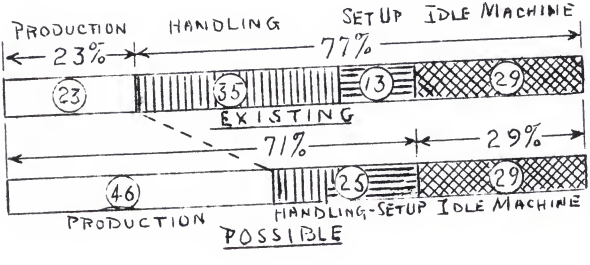
So far, our process charts have been those of the flow type - either following a man or an object - (whether a part or a product or else a piece of paper). In making up these charts we were mainly concerned with the detailed steps in the operation and the distance traveled. It soon becomes apparent, however, that distance is not always the most important factor. TIME may be of far greater importance. This calls for the second tool of measurement - THE MULTIPLE ACTIVITY CHART.

Some of the process chart forms already have a column for time. This may be filled in later on a chart that has been drawn up, showing distance only, or may be put in when the chart is first drawn. Wherever we use machines or equipment, there are three possible ways to lose time: 1. Idle operator time, 2. Idle machine time, 3. Combination of 1 and 2.

There is often a tendency to purchase a new piece of equipment without asking, "Can we do the job more effectively with what we have?" Many executives authorize the purchase of elaborate or automatic equipment without thoroughly investigating to see if it is really justified.

Thus we should be especially interested in delays as they affect machines, rather than mere loss of time on the part of the operator. As machines become more complex, the cost of having them stand idle some of the time may spell the difference between profit and loss. Often these idle times occur at intervals throughout their operating cycle, and are not readily apparent.

The chart below was made in a large plant making electrical equipment. These figures are typical of equipment in most plants. Looking at the bottom line, it can be seen that idle machine time is 29%, and most people would say that this equipment was working 71% of the time. However, if one looks for the actual cutting time, or DO time, it is seen that it averaged only 23%, and the real idle machine time was 77% instead of 29%.



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#23

MULTIPLE ACTIVITY CHARTS

RECOMMENDED BASIC FILMS

G-8 Punching Slugs - Silent - 8 min.
G-10 Spooling 5-yard Plaster - Silent - 8 min.
G-18 Toaster Problem - Silent - 4 min.
G-23 Operate Milling Machine - Silent - 4 min.
G-28 Turn Coil Forms on Lathe - Silent - 15 min.

RECOMMENDED READING

* Motion and Time Study Applications - Ralph M. Barnes

BOOKS

*Motion and Time Study - Ralph M. Barnes
Work Methods Manual - Ralph M. Barnes

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X-T 58.W6 #24

OPERATOR CHARTS - THE THIRD TOOL OF WORK SIMPLIFICATION

If you were going to drive your automobile from Boston to New York and you had never been over the road before, what is the first thing you would do in preparation for the trip? Yes, you would go down to the corner filling station and get a road map. On this map you would find all the roads, principal cities and towns, as well as easily identified landmarks. You would have an "overall" picture of the route by means of which you could plan the best way of proceeding on your trip. Such a map is similar to a flow process chart.

Suppose that you wished to stop off at New Haven on your way and visit a friend whom you hadn't seen for a long time. If you look carefully at your map, you will probably find insets which show the detail of roads within each of the major cities shown on the main map. Reference to this detailed map of New Haven should help you determine the best route off of the main road to your friend's house and back to it again after you have finished your visit. The detailed map of one of the major cities on the larger map is similar to an operator chart.

The OPERATOR CHART (sometimes called a left & right hand chart) is a detailed breakdown of the motions of one particular operator who performs perhaps only one or a few of the details shown on the flow process chart. Once the overall process has been questioned, it is often of great advantage to select the jobs done by different people in that process for individual study. There is not much use to make an operator chart until after the flow process chart has been analyzed. It really stems from the question "How" of the flow process chart and is a tool for analyzing more carefully the details of the operator for the purpose of improvement. Naturally, eliminations, combinations and any advantageous changes in sequence, place or person come first.

In using the operator chart, we follow the same PATTERN of Work Simplification as used before.

STEP 1

Pick the job to improve - An operator is selected who does part of the work indicated in a flow process chart which we have previously made - a job we know - one that is giving us trouble or is a bottleneck - one which we need a more detailed analysis of before we can complete our simplification as started by the flow process chart.

STEP 2

Make a process chart - in this case, the operator chart. We observe the job and get all FACTS just as before.

A-1 58
.W6

X-1 58 .W6 #25

OPERATOR CHARTS

RECOMMENDED BASIC FILMS

J-2 Clipping Brassieres - Silent - 15 min.
J-9 Ice Cream Can - Silent - 8 min.
K-26 Making the Operator Chart - Silent - 15 min.

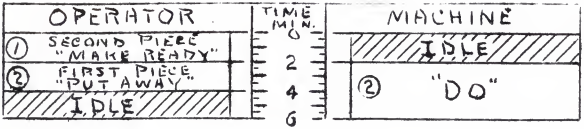
RECOMMENDED READING

*Motion and Time Study Applications - Ralph M. Barnes

BOOKS

* Motion and Time Study - Ralph M. Barnes
  Work Methods Manual - Ralph M. Barnes

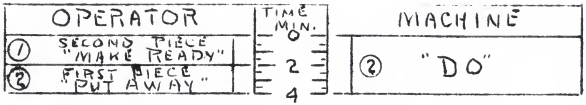
X-T 58
.W6



Now:

Machine Utilization = 66%
Operator Effectiveness ≐ 66%

Or



And: Machine Utilization = 100%
Operator Effectiveness ≐ 100%

In actual practice we would not obtain 100% in either case because the machine would have to stop for oil and adjustment, and the operator would have to stop for rest or personal time, but we would come as close to 100% as can reasonably be expected.

Setting the elements of work down in chart form and classifying the "Make Ready," "Do," and "Put Away" helps us to find ways to improve the job.

Attached is a chart of the operation of a home movie projector. It can be seen that unless a second projector is used, the audience has to wait about one-third of the time for threading and rewinding.

Attached also are the multiple activity charts on spool-winding 5 yards of 12-inch wide adhesive plaster. The plaster is interleaved with a layer of crinoline, placed in a screw-cap canister and packed in a corrugated shipping container. The story on these charts shows again that in almost any operation there are several possibilities for improvement, and only by getting all the facts can one make a sound decision.

WORK ASSIGNMENT - (Optional)

Look over your department and select a simple example for a multiple activity chart. Make the chart on the attached forms, showing the present method and, if possible, also make one on an improvement, either in machine utilization, or operator effectiveness. Bring your chart with you to the next meeting.

.W6

X-T 52 #27

MULTIPLE ACTIVITY CHARTS

RECOMMENDED BASIC FILMS

G-8 Punching Slugs - Silent - 8 min.
G-10 Spooling 5-yard Plaster - Silent - 8 min.
G-18 Toaster Problem - Silent - 4 min.
G-23 Operate Milling Machine - Silent - 4 min.
G-28 Turn Coil Forms on Lathe - Silent - 15 min.

RECOMMENDED READING

* Motion and Time Study Applications - Ralph M. Barnes

BOOKS

*Motion and Time Study - Ralph M. Barnes
Work Methods Manual - Ralph M. Barnes

X-T 58
.W6

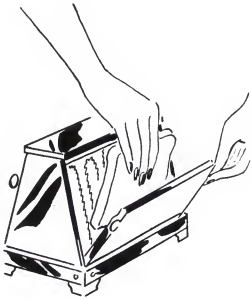
MULTIPLE ACTIVITY PROBLEM

What is the *minimum* total time to toast three slices of bread in a standard toaster, such as that shown below?

The machine toasts one side of each of two pieces at the same time. It takes two hands to insert or remove each slice as illustrated. To turn the slice over, it is merely necessary to push the toaster door all the way down, and allow the spring to bring it back. Thus both slices could be *turned* at the same time, but only one can be inserted or removed.

The time to toast a side is exactly .50 minutes. Time to turn over is .02 minutes. Time to remove toasted slice and place on plate is .05 minutes, and the time to secure a piece of bread and place in the toaster is .05 minutes.

The problem is to find the shortest possible time required to toast three slices on both sides, starting with bread on plate, and returning toast to plate. Assume toaster is warmed and ready to go.



C-T 58
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WORK SIMPLIFICATION CONFERENCES
LAKE PLACID, N. Y.

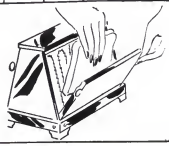
MULTIPLE ACTIVITY CHART

SUMMARY PER 3 PIECES

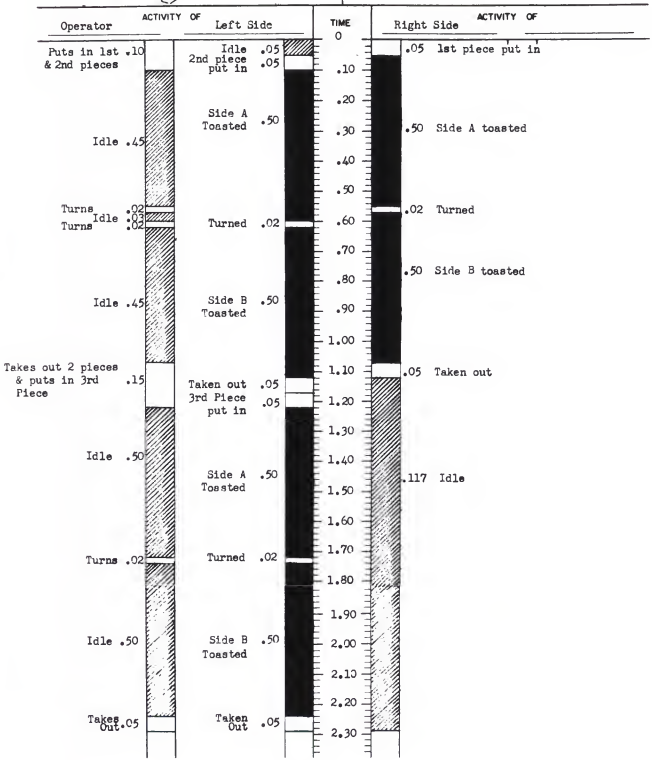
	MAN		MACHINE	
	TIME	%	TIME	%
WORK	.36	15.7	1.50	68.6
IDLE	1.93	84.3	.61	26.6

OPERATION Toast 3 Pieces of Bread
Present METHOD DATE June 3, 1947
ANALYST D. B. P. 1 SCALE DIVISION = .02 Min.

LAYOUT



PART SKETCH



MULTIPLE ACTIVITY CHART

SUMMARY PER ___ PIECES

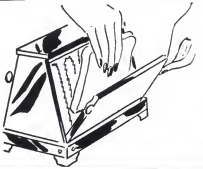
	MAN		MACHINE	
	TIME	%	TIME	%
WORK	.44	24.6	1.50	83.7
IDLE	1.35	75.4	.07	3.9

OPERATION Toast 3 Pieces

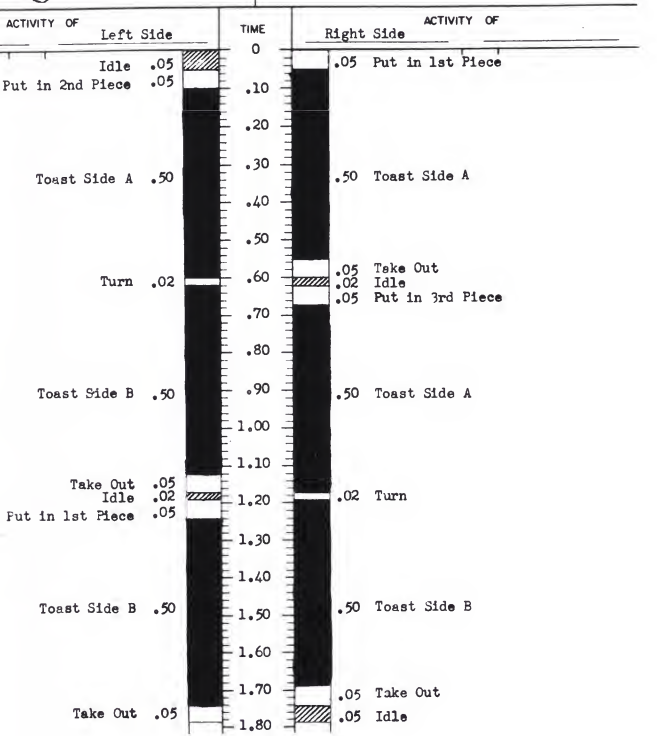
1st Improved METHOD. DATE June 3, 1947

ANALYST D.B.P. 1 SCALE DIVISION = .02 Min.

LAYOUT



PART SKETCH



WORK SIMPLIFICATION CONFERENCES

LAKE PLACID, N. Y.

MULTIPLE ACTIVITY CHART

SUMMARY PER ___ PIECES

MAN		MACHINE	
TIME	%	TIME	%
.44	24.8	1.50	85.
1.33	75.2	.05	2.8

OPERATION Toast 3 Pieces

2nd Improved METHOD. DATE June 3, 1947

ANALYST D.B.P. 1 SCALE DIVISION = .02 Min.

PART SKETCH

Operator	ACTIVITY OF Left Side	TIME	ACTIVITY OF Right Side
	Idle .05	0	.05 Put in 1st Piece
	Put in 2nd Piece .05	.10	
		.20	
Idle	Toast Side A .50	.30	.50 Toast Side A
		.40	
		.50	
Idle		.60	.02 Turn
	Take Out .05		
	Put in 3rd Piece .05	.70	
		.80	
Idle		.90	.50 Toast Side B
	Toast Side A .50	1.00	
		1.10	.05 Take Out
			.05 Put in 2nd Piece
Idle	Turn .02	1.20	
		1.30	
		1.40	
Idle	Toast Side B .50	1.50	.50 Toast Side B
		1.60	

T 5
W6

Nov 27 1954 #32

OPERATOR CHARTS -
THE THIRD TOOL OF WORK SIMPLIFICATION

If you were going to drive your automobile from Boston to New York and you had never been over the road before, what is the first thing you would do in preparation for the trip? Yes, you would go down to the corner filling station and get a road map. On this map you would find all the roads, principal cities and towns, as well as easily identified landmarks. You would have an "overall" picture of the route by means of which you could plan the best way of proceeding on your trip. Such a map is similar to a flow process chart.

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STEP 2

Make a process chart - in this case, the operator chart. We observe the job and get all FACTS just as before.

58
16

X-Tra. No #23

OPERATOR CHARTS

RECOMMENDED BASIC FILMS

J-2 Clipping Brassieres - Silent - 15 min.
J-9 Ice Cream Can - Silent - 8 min.
K-26 Making the Operator Chart - Silent - 15 min.

RECOMMENDED READING

*Motion and Time Study Applications - Ralph M. Barnes

BOOKS

* Motion and Time Study - Ralph M. Barnes
  Work Methods Manual - Ralph M. Barnes

WORK SIMPLIFICATION CONFERERENCES
LAKE PLACID, N Y

NO. _____
PAGE 1 OF 1

SUMMARY PER ____ PIECES

	PRESENT		PROPOSED		DIFFERENCE	
	LH	RH	LH	RH	LH	RH
OPERATIONS	0	5				
TRANSPORTS	0	3				
HOLDS	8	0				
DELAYS	0	0				
TOTAL	8	8				

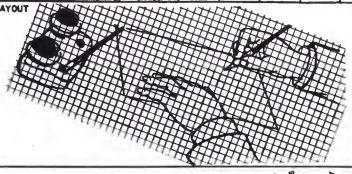
RIGHT AND LEFT HAND CHART

OPERATION Signing Letter

PRESENT / ~~PROPOSED~~ METHOD. DATE 3/15/49

OPERATOR Joe Blutz ANALYST Bill Blow

LAYOUT



PARTS SKETCH

LEFT HAND	OPER.	TRANS.	HOLD	DELAY		OPER.	TRANS.	HOLD	DELAY	RIGHT HAND
Hold letter	○	⇨	▽	D	1	○	⇨	▽	D	Reach for pen
,, ,,	○	⇨	▽	D	2	○	⇨	▽	D	Grasp pen
,, ,,	○	⇨	▽	D	3	○	⇨	▽	D	Carry to paper
,, ,,	○	⇨	▽	D	4	○	⇨	▽	D	Position pen for signing
,, ,,	○	⇨	▽	D	5	●	⇨	▽	D	Sign letter
,, ,,	○	⇨	▽	D	6	○	⇨	▽	D	Return pen to holder
,, ,,	○	⇨	▽	D	7	○	⇨	▽	D	Position pen in holder
,, ,,	○	⇨	▽	D	8	○	⇨	▽	D	Release pen
	○	⇨	▽	D	9	○	⇨	▽	D	
	○	⇨	▽	D	10	○	⇨	▽	D	
	○	⇨	▽	D	11	○	⇨	▽	D	
	○	⇨	▽	D	12	○	⇨	▽	D	
	○	⇨	▽	D	13	○	⇨	▽	D	
	○	⇨	▽	D	14	○	⇨	▽	D	
	○	⇨	▽	D	15	○	⇨	▽	D	
	○	⇨	▽	D	16	○	⇨	▽	D	
	○	⇨	▽	D	17	○	⇨	▽	D	
	○	⇨	▽	D	18	○	⇨	▽	D	
	○	⇨	▽	D	19	○	⇨	▽	D	
	○	⇨	▽	D	20	○	⇨	▽	D	
	○	⇨	▽	D	21	○	⇨	▽	D	